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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,994	03/05/2002	Noriyuki Yamamoto	900-420	4459

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EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 06/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/087,994

Applicant(s)

YAMAMOTO ET AL.

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2,5,8-13,22,25,28,30,32,34 and 35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5,9,10,12,13,25,28,30,32,34 and 35 is/are allowed.
- 6) ☒ Claim(s) 2,8,11 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 30, 2006 has been entered.

This Office action addresses claims 2, 5, 8-13, 22, 25, 28, 30, 32, 34, and 35. Claims 5, 9, 10, 12, 13, 25, 28, 30, 32, 34, and 35 are allowed. Claim 11 remains rejected under 35 USC 112 first and second paragraphs. Claims 2, 8, 11, and 22 remain rejected under 35 USC 103. This action is non-final.

### ***Claim Rejections - 35 USC § 112***

2. Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 11 recites that "the filter being formed within the housing in the supply section." The application as originally filed does not appear to support the configuration of the filter being located within the housing. Correction is required.

3. Claims 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. As noted above, claim 11 recites that "the filter being formed within the housing in the supply section." This limitation causes confusion because the supply section is defined by the claims as being outside of the housing. Thus, the filter cannot be in both the supply section and the housing, as claimed. Correction is required.

***Claim Rejections - 35 USC § 103***

4. Claims 2, 8, 11, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al (*Applied Biochem. and Bioeng.*, 1983) in view of Karube et al (*Biotech. and Bioeng.* 1977).

In the abstract, Suzuki teaches fuel cells employing immobilized *Clostridium butyricum* for hydrogen production. Regarding claim 22, the fuel may comprise formic acid, among other materials (see p. 292). As shown in Figure 10, the fuel cell has a platinum black anode electrically connected to a nickel mesh current collector.

Suzuki does not expressly teach that the fuel cell comprises a polymer electrolyte or a housing as recited in the instant claims.

However, it is submitted that the artisan would be motivated to incorporate the fuel cell of Suzuki into a housing. Such a housing would be useful to prevent mixing of reactants and to

extend the life of the components of the cell. As such, this limitation is not considered to distinguish over the disclosure of Suzuki. Regarding the limitation that the fuel cell is a polymer electrolyte fuel cell, it would also be obvious to use such an electrolyte in the fuel cell of Suzuki. These fuel cells are known to operate at lower temperatures but still have a relatively high efficiency. As such, it would be obvious to use such an electrolyte in the fuel cells of Suzuki.

Suzuki further does not expressly teach that the anode-side collector serves as the layer containing the biochemical catalyst, as recited in the instant claims.

Karube et al. teach a fuel cell having a layer of *C. butyricum* immobilized on the surface of the fuel cell anode (see Figure 1 of the reference).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to immobilize the layer of catalyst on the anode current collector of Suzuki. Such a modification would allow for the simplification of the system of Suzuki by reducing the number of components.

Furthermore, Karube et al. refer to the cells as “immobilized,” which is also the term used by Suzuki. As such, the Karube reference evidences that immobilization directly on the electrode is useful. In the case of Suzuki, this would translate to immobilization on the nickel mesh current collector shown in Figure 10. As such, the claimed subject matter would be rendered obvious to the skilled artisan. Furthermore, the anode side of the current collector is inherently conductive as recited in the instant claims.

***Response to Arguments***

5. Applicant's arguments filed May 30, 2006 have been fully considered but they are not persuasive. It is still believed that the Suzuki and Karube references, taken in combination, fairly suggest the claimed current collector and catalyst structure. The anode side of the collector of Suzuki would inherently have electrical conductivity since it is in direct contact with the anode electrocatalyst. Furthermore, it is made from nickel mesh. As such, the rejection over the Suzuki and Karube references is believed to be proper.

***Conclusion***

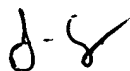
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau  
Primary Examiner  
Art Unit 1745  
June 6, 2006